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Agilent Technologies

Filament Replacement for VS C15 Leak Detector

FIELD INSTALLATION INSTRUCTIONS

Part Number 699910013
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Filament Replacement for VS C15 Leak Detector

Preface

Documentation Standards

This manual uses the following documentation standards:

NOTE

Notes contain important information.

CAUTION

Cautions appear before instructions, which if not followed, could cause damage to the equipment or data loss.

WARNING

Warnings appear for a particular procedure or practice which, if not followed correctly, could lead to serious injury or death.

Hazard and Safety Information

The common international symbols used in this manual and on the equipment are defined below.

OFF Supply (Power)

ON Supply (Power)

AC – Alternating Current

Warning, Risk of danger

Frame or chassis Terminal

Earth (Ground) Terminal

Caution, Hot Surface

Caution, Risk of Electrical Shock

Protective Conductor Terminal

Operators and service personnel must be aware of all hazards associated with this equipment. They must know how to recognize hazardous and potentially hazardous conditions, and know how to avoid them. The consequences of unskilled, improper, or careless operation of the equipment can be serious. Every operator or service person must read and thoroughly understand operation/maintenance manuals and any additional information provided by Varian. All warning and cautions must be read carefully and strictly observed. Consult local, state, and national agencies regarding specific requirements and regulations. Address any safety, operation, and/or maintenance questions to your nearest Varian office.

Solvents

WARNING

The mechanical components of leak detectors may be cleaned with one of the recommended solvents. When heated, sprayed, or exposed to high-temperature equipment, these solvents become flammable and explosive, causing serious injury or death. Do not use these solvents near a high-temperature source. Ventilate the working area with a blower and work in a large, well-ventilated room.

Solvents are irritants, narcotics, depressants and/or carcinogens. Their inhalation and/or ingestion may produce serious side effects. Prolonged or continued contact with the skin results in absorption through the skin and moderate toxicity. Always ensure that cleaning operations are carried out in large, well-ventilated rooms, and wear eye shields, gloves, and protective clothing.

Due to the effective cleaning nature of VacuSolv solvent and its residue-free properties, Varian Component and Spectrometer Cleaning Kit (Part Number 670029096), used in accordance with the kit instructions, is recommended for cleaning spectrometer components. The kit can also be used for fine cleaning of other parts in the leak detector's vacuum system such as valves and fittings. No rinsing steps or high-temperature drying is required following cleaning with VacuSolv. Although appropriate precautions are advised, VacuSolv is compatible with most materials and does not contain toxic chemicals or CFCs (chlorofluorocarbons). Other acceptable solvents are isopropyl alcohol (IPA) or Dow Corning® OS-20.

To clean the leak detector enclosure, the LCD display and Front Panel buttons, use only a soft cloth slightly dampened with water or a mild soap.

Do NOT use excess water or cleaning solvents of any kind.

Avoid splashing any cleaning solvents into the unit through the ventilation openings or Front Panel buttons. Wipe the surface with a dry lint-free cloth.

Vacuum Equipment and Cleanliness

Cleanliness is vital when servicing the leak detector or any vacuum equipment. There are some techniques that are more important in leak detector servicing than in general vacuum work:

CAUTION

Wear non-powdered, ESD-safe Nitride or equivalent gloves to prevent skin oils from getting on spectrometer internal components.

O-ring Care

When removing, checking or replacing O-rings, keep in mind the following:

NOTE

Varian recommends replacing all O-rings during routine maintenance or during any maintenance procedure requiring that O-rings be removed.

CAUTION

Remove O-rings carefully with your fingers. Do not use metal tools for this task; this prevents scratching of any sealing surfaces.

- **Wipe all O-rings clean with a lint-free cloth before installation to ensure that no foreign matter is present to impair the seal.**
- **Do not use grease or any other substance on O-rings that will come in contact with the vacuum surfaces.**
- **Do not use alcohol, methanol or other solvents on O-rings. Doing so causes deterioration and reduces their ability to hold a vacuum.**
- **Varian does not recommend the use of vacuum grease. If applicable, apply a small amount of Apiezon® L grease and wipe the O-rings shiny dry.**

Spectrometer

CAUTION

Store the Ion Source/Preamplifier sub-assembly in a cool, dry area in a tightly sealed, ESD protected container. Wear non-powdered, ESD-safe Nitride or equivalent gloves when handling the spectrometer. Wash hands thoroughly after handling the spectrometer filaments and especially before smoking or eating.

The spectrometer and PCB's are static sensitive devices. Wear a grounding strap when performing any maintenance on these units and especially when performing maintenance of static sensitive parts.

CAUTION

The spectrometer operates at a very high vacuum produced by the high vacuum turbomolecular pump. Service of the spectrometer requires that this vacuum be vented to the atmosphere.

Equipment Required

Metric Allen Wrench (Range 1.5mm to 10mm)	M3 Philips head screwdriver
Non-powdered ESD-safe Nitrile or equivalent gloves	Isopropyl alcohol
Torque wrench, M5 head (must be adjustable to 45 in-lbs (5.0 N-m) and 90 in-lbs (10.2 N-m)	

Installation Procedure

WARNING

Disconnect power from the unit before performing any maintenance procedure that requires physically disconnecting any part of the system.

NOTE

Inspect the kit for deformation, damage and filament coating flaking prior to installation. Do not install if damaged. Touching the filament under any condition will cause damage.

1. Disconnect the power to back of the unit and unplug.
2. Wait 30 seconds for the high voltage to dissipate.
3. Using an M4 Allen wrench, remove the two screws on the unit's top and open the unit (Figure 1: Unit Top Screws).

Figure 1: Unit Top Screws

4. If the unit was just running, either:

- Open the turbo vent valve, if the internal calibrated leak option was not installed (Figure 2: Turbo Vent),
- Or crack the NW16 connection (Figure 3: NW-16 Vent) on the calibrated leak to bring the turbo to a controlled stop.

Figure 2: Turbo Vent

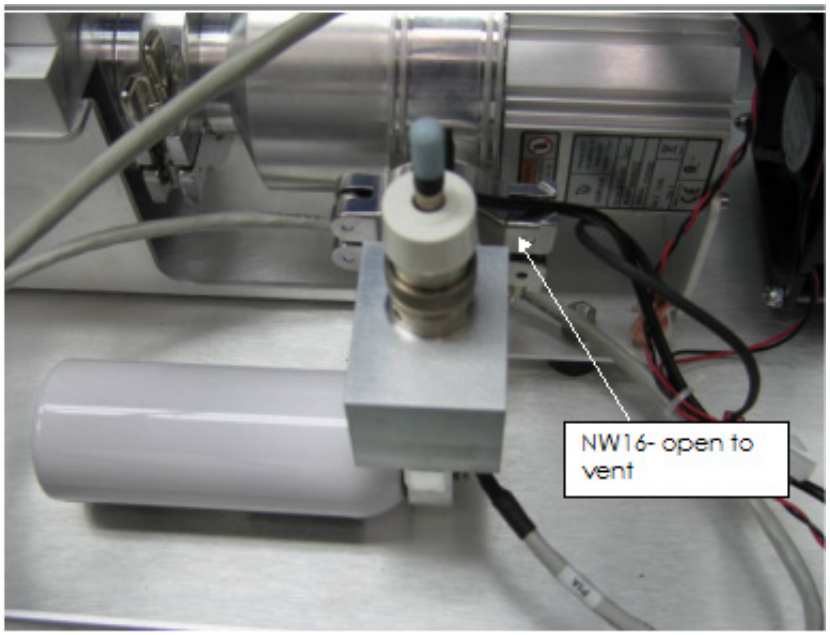

Figure 3: NW-16 Vent

5. Disconnect both cables from the spectrometer (Figure 4: Cables To Spectrometer).

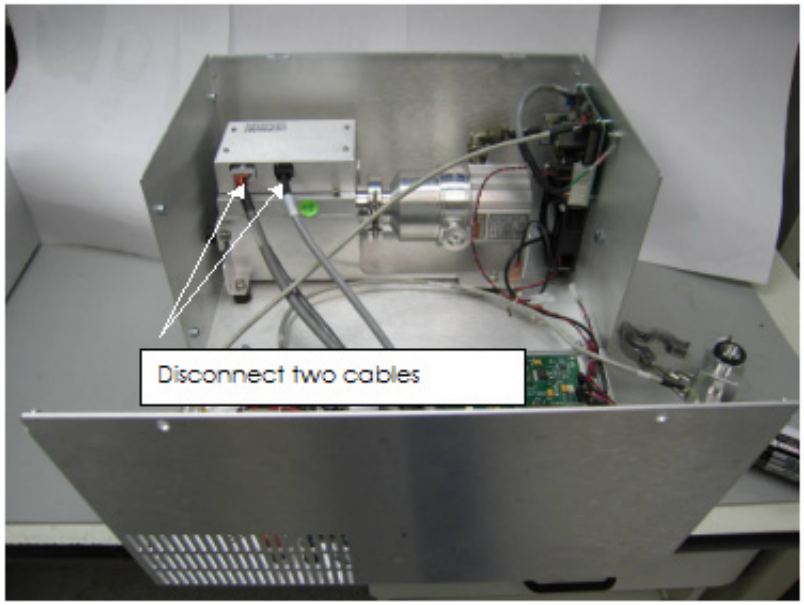

Figure 4: Cables To Spectrometer

CAUTION **Static sensitive device, ensure that personnel are properly grounded before proceeding.**

6. Using an M3 Philips head screw driver, remove the four screws holding the spectrometer cover and ground strap on (Figure 5: Spectrometer Cover Screws).

Figure 5: Spectrometer Cover Screws

7. Using an M5 allen wrench, remove the six screws holding on the spectrometer header assembly (Figure 6: Spectrometer Header Assembly Screws).

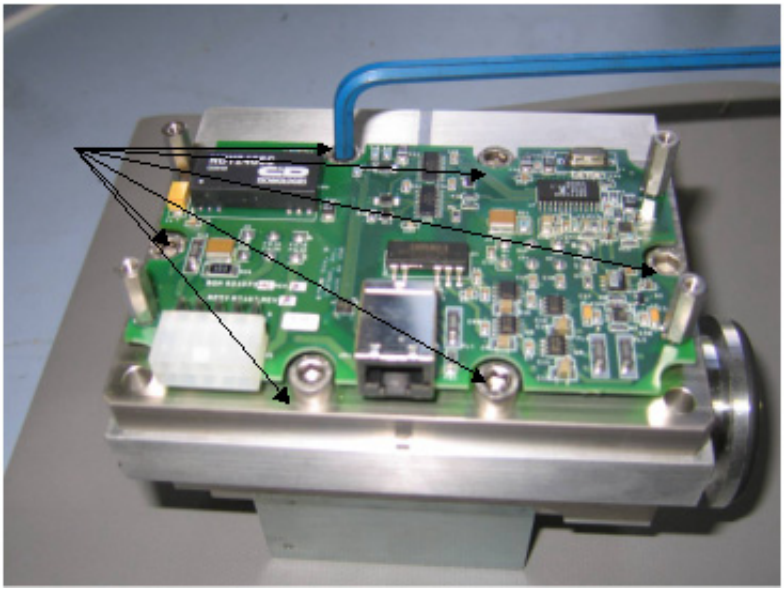

Figure 6: Spectrometer Header Assembly Screws

NOTE

Wear non-powdered, ESD-safe Nitride or equivalent gloves (not included in kit) to prevent skin oils from getting on vacuum surfaces. Ensure that personnel are properly grounded before proceeding.

8. Remove the spectrometer header assembly (Figure 7: Spectrometer Assembly Removal).

Figure 7: Spectrometer Assembly Removal

9. Remove the O-ring and discard (Figure 8: O-ring).

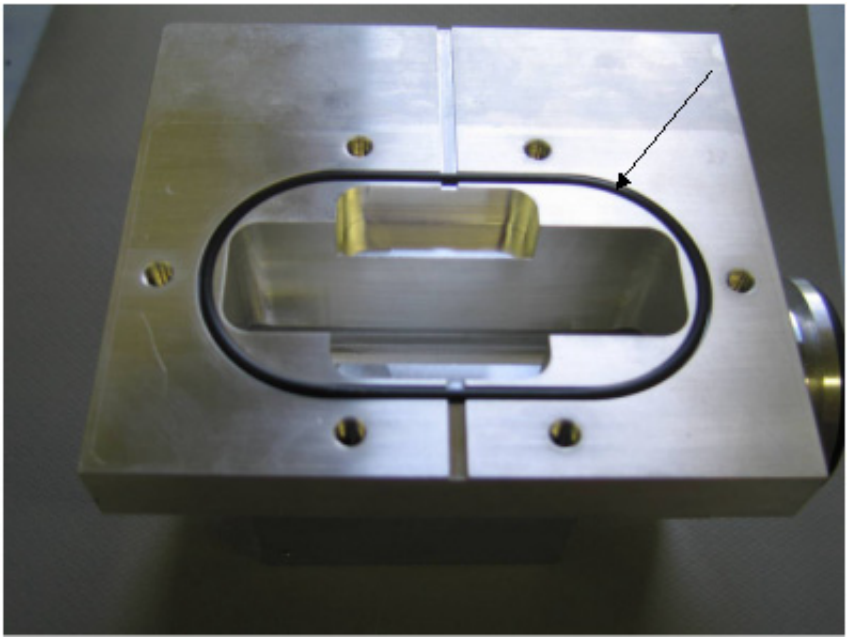

Figure 8: O-ring

10. If the inside of the spectrometer body appears to be dirty, clean it with a lint free wipe and Isopropyl alcohol (Figure 9: Inside of Spectrometer Body).

NOTE

Varian recommends that you use the Vac-u-solv spectrometer cleaning kit (PN: 670029096).

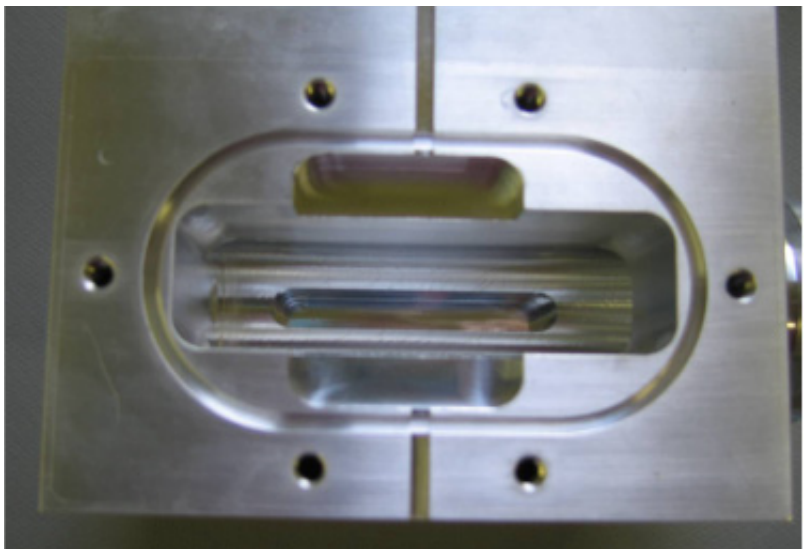

Figure 9: Inside of Spectrometer Body

11. On a clean work surface, remove the defective filament(s) (item 4) from the spectrometer by loosening the two coupler screws. Then loosen the M2 screw and washer and remove the defective filament (Figure 10: Coupler Screws).

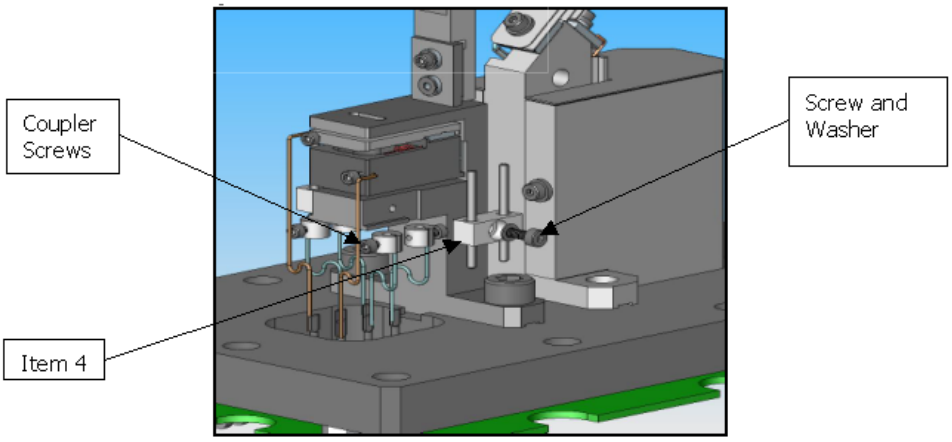

Figure 10: Coupler Screws

12. Inspect the new filament assembly for deformation, damage and flaking of the coating prior to installation. Do not install if damaged.
13. Insert new filament assembly into the coupler.
14. Guide the ceramic against the bottom and side ribs of the ion source support block (Figure 11: Coupler and Filament Assembly and Figure 12: Filament Position). Correct positioning of filament is critical for proper spectrometer operation.

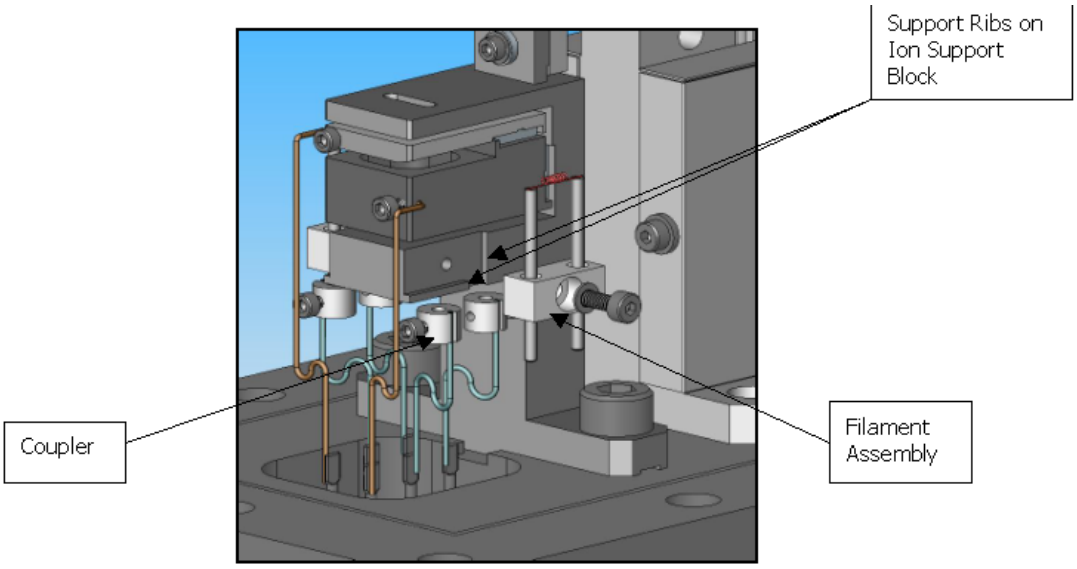

Figure 11: Coupler and Filament Assembly

15. While holding the filament in position, insert the M2 screw and washer and tighten (Figure 12: Filament Position).
16. Tighten the coupler screws onto the filament posts (Figure 12: Filament Position).
17. Verify ceramic is tight against the bottom and right side ribs. Ensure that the filament is positioned in the slot of the ion source as shown (Figure 12: Filament Position and Figure 13: Filament Alignment).

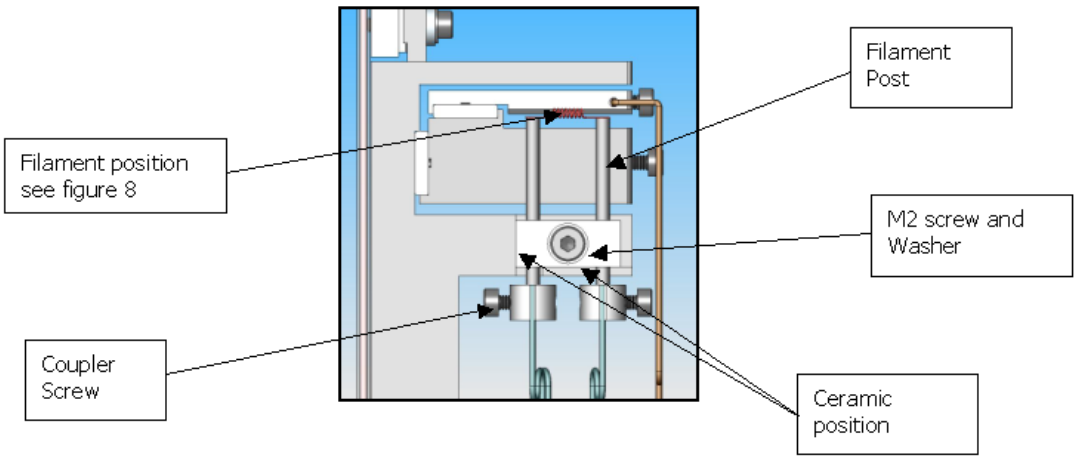

Figure 12: Filament Position

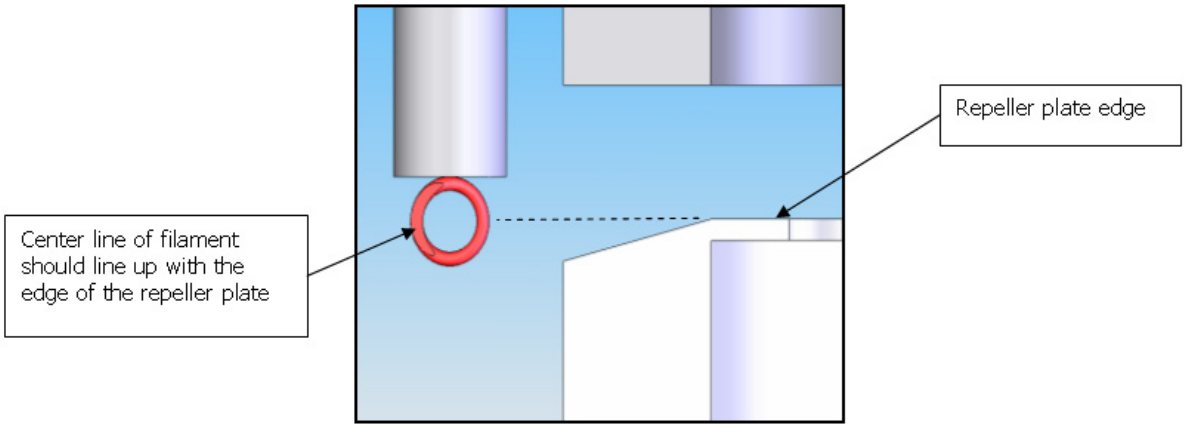

Figure 13: Filament Alignment

18. Clean the mating surfaces of the spectrometer body and header with Isopropyl alcohol and a clean lint free wipe.
19. Install the new header with the six existing screws. Torque to 10.2 N-M (90 IN-LB).

NOTE **The cones of the Belleville washers should all point to the head of the screw.**

20. On the PCB, use the resistance meter to verify an open circuit between any two of the six ion source header pins (except FIL-1 to FIL-1 and FIL-2 to FIL-2 which should be 0.3 Ohms or less). Also verify an open circuit between the body of the spectrometer and any of the ion source header pins (Figure 14: Ion Source Header Pin Schematic). If there is continuity (short circuit) at any of the points, remove the header and inspect for shorting.

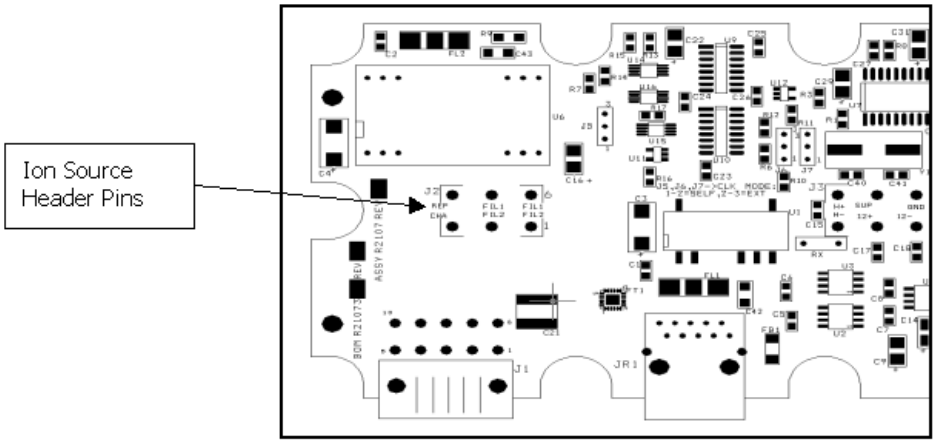

Figure 14: Ion Source Header Pin Schematic

21. Re-Install the cover with the four screws.
22. Re-plug in both cables and ground strap.
23. Verify that turbo vent valve is closed.
24. Leak check the spectrometer to ensure a leak free joint.
25. Close the cover and secure using existing hardware.
26. Power up the leak detector.
27. Let the unit run for 20 minutes, then perform a calibration (via the I/O, front panel display or RS232), per the user manual, to validate a successful installation.

Sales and Service Offices

Canada
Central coordination through:
Varian, Inc.
121 Hartwell Avenue
Lexington, MA 02421
USA
Tel.: +1 781 861 7200
Toll-Free: +1 800 882 7426
Fax: +1 781 860 5437

China
Varian Technologies China, Ltd.
Room 1648
Central Tower South Wing
Beijing Junefield Plaza
No. 10 XuanWuMenWai Street
Beijing 100052
P. R. China
Tel.: +86 (10) 6310 8550
Toll-Free: 800 820 6556
Fax: +86 (10) 6310 0141

France
Varian s.a.
7 avenue des Tropiques
Z.A. de Courtaboeuf - B.P. 12
91941 Les Ulis cedex
France
Tel.: +33 (0) 1 69 86 38 84
Fax: +33 (0) 1 69 86 29 88

Benelux
Varian Vacuum Technologies
Herculesweg 8
4338 PL Middelburg
The Netherlands
Tel.: +31 118 671570
Fax: +31 118 671569

Germany & Austria
Varian Deutschland GmbH
Alsfelder Strasse 6
Postfach 11 14 35
64289 Darmstadt
Germany
Tel.: +49 (0) 6151 703 353
Fax: +49 (0) 6151 703 302

India
Varian India Pvt. Ltd.
205-A, "A" wing of Galleria
2nd floor, Hiranandani Gardens
Powai, Mumbai-400 076
India
Tel.: +91 22 2570 8595/8597
Fax: +91 22 2570 8599
Mobile: +91 98 679 55969

Italy
Varian, Inc.
via F.lli Varian 54
10040 Leini, (Torino)
Italy
Tel.: +39 011 997 9111
Toll-Free: 00 800 234 234 00
Fax: +39 011 997 9350

Japan
Varian Technologies Japan, Ltd.
8th Floor
Sumitomo Shibaura Building
4-16-36 Shibaura Minato-ku
Tokyo 108
Japan
Tel.: +81 3 5232 1253
Toll-Free: 0120 655 040
Fax: +81 3 5232 1710

Korea
Varian Technologies Korea, Ltd.
Shinsa 2nd Bldg. 2F
966-5 Daechi-dong
Kangnam-gu, Seoul
Korea 135-280
Tel.: +82 2 3452 2452
Toll-Free: 080 222 2452
Fax: +82 2 3452 2451

Mexico
Varian, S. de R.L. de C.V.
Concepcion Beistegui No 109
Col Del Valle
C.P. 03100
Mexico, D.F.
Tel.: +52 5 523 9465
Fax: +52 5 523 9472

Taiwan
Varian Technologies Asia, Ltd.
14F-6, No. 77, Hsin Tai Wu Road, Sec. 1
Hsi chih, Taipei Hsien
Taiwan, R.O.C.
Tel.: +886 2 2698 9555
Toll Free: 0800 051 342
Fax: +886 2 2698 96782

UK & Ireland
Varian Ltd.
6 Mead Road
Oxford Industrial Park
Yarnton, Oxford OX5 1QU
UK
Tel.: +44 (0) 1865 291570
Fax: +44 (0) 1865 291571

United States
Varian, Inc
121 Hartwell Avenue
Lexington, MA 02421
USA
Tel.: +1 781 861 7200
Toll-Free: +1 800 882 7426
Fax: +1 781 860 5437

Other Countries
Varian Vacuum Technologies
via F.lli Varian 54
10040 Leini, (Torino)
Italy
Tel: (39) 011 997 9 111
Fax: (39) 011 997 9 350

Customer Support and Service:

North America
Tel: 1 (800) 882-7426 (toll-free)
vtl.technical.support@varianinc.com

Europe
Tel: 00 (800) 234 234 00 (toll-free)
vtl.technical.support@varianinc.com

Japan
Tel: (81) 3 5232 1253 (dedicated line)
vtj.technical.support@varianinc.com

Korea
Tel (82) 2 3452 2452 (dedicated line)
vtk.technical.support@varianinc.com

Taiwan
Tel: 0 (800) 051 342 (toll-free)
vtw.technical.support@varianinc.com

Worldwide Web Site,
Catalog and On-line Orders:
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VARIAN